APPENDIX

What is claimed is:

1. A method for depositing a platinum group metal on a substrate, comprising the steps of:

depositing said platinum group metal onto a substrate in a CVD deposition chamber in the presence of both oxygen and nitrous oxide, wherein said oxygen and said nitrous oxide are at a predetermined ratio with a combined flow rate in the range of about 1500 sccm to about 2500 sccm, at a predetermined temperature and at a pressure of from about 10 to about 1000 Torr.

2. The method according to claim 1, wherein said platinum group metal is selected from the group consisting of Ru, Rh, Pd, Os, Ir and Pt.

3. The method according to claim 2, wherein said platinum based metal is Pt.

4. The method according to claim 1, wherein said predetermined temperature is from about 200^{0}C to about 600^{0}C.

6. A method for depositing a platinum group metal on a substrate, comprising the steps of:

introducing a substrate into a CVD deposition chamber;

bubbling a gas over an organic platinum based metal precursor;

introducing said gas and said organic platinum based metal precursor to said CVD deposition chamber;

introducing oxygen to said CVD deposition chamber at a predetermined first flow rate;

introducing nitrous oxide to said deposition chamber at a predetermined second flow rate, to provide a total flow rate of said first and said second flow rates in the range of about 1500 sccm to about 2500 sccm; and

depositing said platinum group metal onto said substrate in said CVD deposition chamber at a predetermined temperature and at a pressure of from about 10 to about 1000 Torr.

7. The method according to claim 6, wherein said gas is a non-reactive gas.

8. The method according to claim 6, wherein said organic platinum based metal precursor is selected from the group consisting of cyclopentadienyl trimethylplatinum (IV) and methylcyclopentadienyl trimethylplatinum.

9. The method according to claim 8, wherein said organic platinum based metal precursor is methylcyclopentadienyl trimethylplatinum.

10. The method according to claim 6, wherein said predetermined temperature is from about 200°C to about 600°C.

12. The method according to claim 7, wherein said non-reactive gas is selected from the group consisting of nitrogen, helium, neon, argon, krypton, and xenon.

13. The method according to claim 12, wherein said non-reactive gas is selected from the group consisting of helium, argon and nitrogen.

14. The method according to claim 13, wherein said non-reactive gas is helium.

15. The method according to claim 7, wherein said non-reactive gas is introduced into said CVD deposition chamber at a rate of about 50 to about 500 sccm.

16. The method according to claim 15, wherein said non-reactive gas is introduced into said CVD deposition chamber at a rate of about 200 sccm.

17. The method according to claim 6, wherein the ratio of oxygen: nitrous oxide in the CVD deposition chamber is from about 5:95::95:5.

18. The method according to claim 17, wherein said ratio is from about 46:60::60:40.

19. The method according to claim 18, wherein said ratio is about 50:50.

20. The method according to claim 6, wherein said substrate is selected from the group consisting of silicon, TiN, Ti, oxides, Si_3N_2, and silicide.

21. The method according to claim 20, wherein said substrate is selected from the group consisting of borophosphosilicate glass and silicon.

22. The method according to claim 6, wherein said substrate is a capacitor for a memory cell.

23. The method according to claim 6, wherein said platinum based metal is deposited onto said substrate in said CVD deposition chamber for a time of about 75 to about 150 seconds.

24. The method according to claim 6, wherein said platinum based metal is deposited at a thickness of from about 50 to about 1000 Angstroms.

25. A method for depositing platinum onto a substrate, comprising the steps of:

introducing a substrate into a CVD deposition chamber;

bubbling a non-reactive gas over an organic platinum precursor selected from the group consisting of cyclopentadienyl trimethylplatinum (IV) and methylcyclopentadienyl trimethylplatinum;

introducing said non-reactive gas and said organic platinum precursor to said CVD deposition chamber;

introducing a 50/50 mixture by volume of oxygen and nitrous oxide to said CVD deposition chamber, said mixture of oxygen and nitrous oxide having a combined flow rate in the range of about 1500 sccm to about 2500 sccm;

depositing said platinum group metal onto said substrate in said CVD deposition chamber at a temperature of from about 200 to about 600 °C and pressure of from about 10 to about 1000 Torr to form a continuous, substantially uniform film on said substrate.

26. The method according to claim 25, wherein said organic platinum precursor is methylcyclopentadienyl trimethylplatinum.

27. The method according to claim 25, wherein said substrate is selected from the group consisting of silicon, TiN, Ti, oxides, Si_3N_2, and silicide.

28. The method according to claim 27, wherein said substrate is selected from the group consisting of borophosphosilicate glass and silicon.

29. The method according to claim 28, wherein said substrate is a capacitor for a memory cell.

30. The method according to claim 25, wherein said temperature is about 275°C.

31. The method according to claim 30, wherein said pressure is about 30 Torr.

32. The method according to claim 25, wherein platinum is deposited onto said substrate in said CVD deposition chamber for a time of about 100 to about 120 seconds.

33. The method according to claim 25, wherein said platinum based metal is deposited at a thickness of about 500 Angstroms.

34. The method according to claim 25, wherein said non-reactive gas is selected from the group consisting of nitrogen, helium, neon, argon, krypton, and xenon.

35. The method according to claim 34, wherein said non-reactive gas is helium.

36. The method according to claim 25, wherein said non-reactive gas is introduced into said CVD deposition chamber at a rate of about 200 sccm.

46. The method according to claim 1, wherein said pressure is from about 10 to about 50 Torr.

47. The method according to claim 1, wherein said pressure is from about 15 to about 30 Torr.

48. The method according to claim 6, wherein said pressure is from about 10 to about 50 Torr.

49. The method according to claim 6, wherein said pressure is from about 15 to about 30 Torr.

50. The method according to claim 20, wherein said oxides are selected from the group consisting of borophosphosilicates and phosphosilicates.

51. The method according to claim 21, wherein said substrate is formed of polysilicon.

52. The method according to claim 25, wherein said pressure is from about 10 to about 50 Torr.

53. The method according to claim 25, wherein said pressure is from about 15 to about 30 Torr.

54. The method according to claim 28, wherein said oxides are selected from the group consisting of borophosphosilicates and phosphosilicates.

55. The method according to claim 21, wherein said substrate is formed of polysilicon.

56. A method for depositing a platinum group metal on a substrate, comprising the steps of:

depositing said platinum group metal onto a substrate in a CVD deposition chamber in the presence of both oxygen and nitrous oxide, wherein said oxygen and nitrous oxide are at a predetermined ratio with a combined flow rate in the range of about 1500 sccm to about 2500 sccm, said depositing being performed at a predetermined temperature of from about 200 °C to about 300 °C.

57. The method of claim 56, wherein said step of depositing said metal is performed under a predetermined time of about 45 seconds to about 1000 seconds.

58. The method of claim 57, wherein said predetermined time is preferably of about 75 seconds to about 150 seconds.

59. The method of claim 56, wherein said predetermined temperature is in the range of 250 °C to 300 °C.

60. The method of claim 56, wherein said predetermined ratio is of approximately 50:50 and said combined flow rate is about 1800 sccm.

61. A method for depositing a platinum group metal on a substrate, comprising the steps of:

introducing a substrate into a CVD deposition chamber;

bubbling a gas over an organic platinum based metal precursor;

introducing said gas and said organic platinum based metal precursor to said CVD deposition chamber;

introducing oxygen to said CVD deposition chamber at a predetermined first flow rate;

introducing nitrous oxide to said deposition chamber at a predetermined second flow rate, to provide a total flow rate of said first and said second flow rates in the range of about 1500 sccm to about 2500 sccm; and

depositing said platinum group metal onto said substrate in said CVD deposition chamber at a predetermined temperature of from about 200 °C to about 300 °C.

62. The method of claim 61, wherein said step of depositing said metal is performed under a predetermined time of about 45 seconds to about 1000 seconds.

63. The method of claim 62, wherein said predetermined time is preferably of about 75 seconds to about 150 seconds.

64. The method of claim 61, wherein said predetermined temperature is in the range of 250 °C to 300 °C.

65. The method of claim 61, wherein oxygen and nitrous oxide are introduced at a ratio of approximately 50:50, with said first flow rate of about 900 sccm and said second flow rate of about 900 sccm.

66. A method for depositing platinum onto a substrate, comprising the steps of:

introducing a substrate into a CVD deposition chamber;

bubbling a non-reactive gas over an organic platinum precursor selected from the group consisting of cyclopentadienyl trimethylplatinum (IV) and methylcyclopentadienyl trimethylplatinum;

introducing said non-reactive gas and said organic platinum precursor to said CVD deposition chamber;

introducing a 50/50 mixture by volume of oxygen and nitrous oxide to said CVD deposition chamber, said mixture of oxygen and nitrous oxide having a combined flow rate in the range of about 1500 sccm to about 2500 sccm;

depositing said platinum group metal onto said substrate in said CVD deposition chamber at a temperature of from about 200 °C to about 300 °C and a time of from about 45 seconds to about 1000 seconds to form a continuous, substantially uniform film on said substrate.

67. The method of claim 66, wherein said temperature is in the range of 250 °C to 300 °C.

68. The method of claim 66, wherein said time is preferably of about 75 seconds to about 150 seconds.